

Chapter 2: Regionwide Pacific Coastal Salmon Recovery Fund Performance

Projects and activities funded through the PCSRF and implemented by states and tribes contribute to progress in restoring and conserving Pacific salmon. The Performance Reporting Framework described in the previous chapter provides a structured means to begin to examine where and how this progress is occurring. The activities and projects undertaken with FY 2000-2005 PCSRF funds comprise the cumulative region-wide contributions of the PCSRF toward salmon sustainability. The outputs and outcomes reported in this chapter serve as the preliminary performance measures for overall program results. Because of the varied and intricate lifecycles of salmon, ascertaining results from completed restoration activities and projects requires several years. The following information presents a cumulative summary of funded and completed projects to protect and restore Pacific salmon from the PCSRF inception in FY 2000 through FY 2005.

Performance Progress

The region-wide output indicators describe progress toward short-term, mid-term, and long-term outcomes, reflecting the goals of the PCSRF. Exhibit 2-1 summarizes the indicators of outputs identified in the Performance Reporting Framework. The outputs of activities and projects completed serve as a first level indicator of state and tribal efforts toward outcomes.

Cumulatively, including riparian, estuarine, wetland, and upland efforts, nearly 290,000 acres of habitat have been

treated and restored, nearly 4,300 acres of wetland and estuarine habitat have been created, and more than 4,200 stream miles treated and restored from program inception in 2000 through December 2005. Additionally, over 100,000 acres of habitat have been protected through acquisition, easement, or lease. Overall, PCSRF funding has improved approximately 410,000 acres of habitat for salmon and steelhead. The outputs represented by these various habitat restoration efforts encompass the many environments used by salmon during the different stages of their life cycle and migration. Upland, riparian,

Oregon Coastal Coho Assessment Project

The state of Oregon, in partnership with NMFS, established the Oregon Coastal Coho Assessment in 1998 to assess state efforts to conserve and rebuild coastal coho salmon populations. One of the key components of the Oregon Coastal Coho Project and Coho Assessment is evaluating the effectiveness of conservation efforts and outcomes in salmon populations. To support the effort several types of data and indicators are collected and assessed, including identification of limiting factors and measurements of changes in those factors such as physical habitat conditions supporting stream complexity, water quantity and quality, and assessment of fish populations. The Coastal Coho Assessment serves as a critical baseline to inform restoration planning and to ensure appropriate allocation of restoration funds. See <http://northcoastexplorer.info/story/story.aspx> for additional information.

Exhibit 2-1: Performance Reporting Framework

Outputs	Regionwide Performance Indicators	Short-Term (<5 years) Outcomes	Mid-Term (5-15 years) Outcomes
Instream habitat projects	985 stream miles treated	Enhanced availability and quality of habitat	Improved status of ESA-listed salmon (naturally spawning populations increased)
Wetland habitat projects	1,911 acres created		
	14,517 acres treated		
Estuarine habitat projects	2,385 acres created		
	3,020 acres treated		
Land acquisition projects	102,096 acres acquired/protected		
	369 stream bank miles acquired or protected		
Riparian habitat projects	3,197 stream miles treated	Improved management practices	Maintained healthy salmon populations
	12,511 acres treated		
Upland habitat projects	267,660 acres treated		
Fish passage projects	1,697 barriers removed		
	3,707 stream miles opened		
	544 fish screens installed		
Hatchery fish enhancement projects	277,482,842 fish marked for management strategies	Habitat limiting factors addressed for ESA-listed salmon	Improved status of ESA-listed salmon (naturally spawning populations increased)
Watershed/species planning and assessment projects	236 assessments completed		
Research, monitoring, and evaluation projects	32,677 miles of streams monitored		
	25 of 26 ESA-listed ESUs and DPSs have identified factors limiting recovery	Habitat limiting factors addressed for ESA-listed salmon	Improved status of ESA-listed salmon (naturally spawning populations increased)
	59% of all projects across recovery domains addressed major habitat limiting factors ⁴		
	Increased salmon populations in 16 out of 20 ESA-listed ESUs/DPSs⁶		Maintained healthy salmon populations
	Data not available for all locations. Alaska maintained escapement goals for 247 out of 250 stocks or stock groups over the last five years ⁵		

⁴ This does not include projects in the Oregon Coast Restoration Area.

⁵ Alaska established escapement goals on salmon stocks or stock groups in each of its four commercial fisheries regions. These stocks or stock groups serve as important indicators for the management of salmon in the respective regions.

⁶ Only 20 of the 26 ESA-listed ESUs/DPSs have sufficient data within the last ten years to assess trends. The trends for the remaining ESUs/DPSs will be assessed when sufficient data are available.

and instream habitat projects provide erosion control, improve instream flow and streambed conditions, and enhance water quality and quantity, all of which are essential for salmon migration, reproduction and juvenile rearing within the watersheds. Outputs affecting estuarine and wetland conditions protect and improve habitat critical for juvenile migration, rearing and transition to the open ocean.

Removal of barriers in streams and rivers inhibiting salmon migration has been an essential component in improving salmon status and condition in the Pacific Coast region. Removal of stream barriers and replacement of ineffective culverts are providing fish access to previously unavailable habitat and increasing overall watershed productivity for salmon. More than 3,700 additional stream miles have been made accessible to fish. In total, nearly 1,700 barriers to salmon habitat have been removed since inception of the PCSRF.

The watershed assessments continue to contribute to the understanding of the factors limiting salmon recovery. Since 2004, factors limiting recovery for 25 of the 26 ESA-Listed ESUs/DPSs have been identified by NMFS. Assessments continue to contribute to site-specific information on watershed and habitat conditions that affect recovery such as poor water quality, inadequate instream conditions, and inadequate canopy cover and vegetation along streambanks. Based on analysis of projects within recovery domains, approximately 60 percent of project activities are addressing habitat factors that are limiting salmon recovery. More detailed data by recovery domain and ESU/DPS are presented in the following chapter.

Monitoring and fish marking programs help to track fish abundance within watersheds and manage hatchery efforts, contributing to understanding restoration status and more informed management practices throughout the region. Additionally, work is being done to maintain all salmon populations at sustainable levels.

The outputs and outcomes discussed in this chapter quantify the activities and projects enacted by states and tribes toward salmon recovery. Salmon habitat restoration efforts and other activities require several years for results in fish returns to be realized. These summary output and outcome measures indicate current progress in habitat availability and condition that contribute to salmon recovery. State and tribal accomplishments and additional progress toward outcomes are discussed in Chapters 3 and 4.

California North Coast Watershed Assessment Program

The California North Coast Watershed Assessment Program (NCWAP) was established in 1999 as an interagency effort to develop consistent scientific data and information on watershed habitat across California's north coast. The program involves multiple state agencies that develop baseline information about watershed conditions, guide watershed restoration and stewardship programs, and establish cooperative approaches to implementation of state and federal laws to protect fish, including anadromous populations of salmon and steelhead. Data are developed on a number of factors, including pollutants, stream characteristics, habitat conditions, and limiting factors. See <http://rap.cdf.ca.gov/projects/esu/esumapframes.html> for additional information.

Washington State Intensively Monitored Watersheds

The Washington State Salmon Recovery Funding Board (SRFB) established "intensively monitored watersheds" in 2004 in four areas of the state to answer the question "Are restoration actions actually creating more salmon within the watersheds where restoration projects are being funded?" Preliminary results are expected by 2007. This project is part of the validation monitoring requested by Congress and OMB to test the effectiveness of restoration actions. The program compares the changes in salmon abundance in streams where projects are occurring to streams where no restoration actions are ongoing. The goals are to evaluate changes in salmon production and to identify needs for future restoration projects. This is a collaborative effort among state and federal agencies, tribes, and the private sector. For more information see: <http://www.ecy.wa.gov/programs/eap/imw/>.



Assessment of Juvenile Chinook Survival in the Skagit River Delta

Tribal biologists from the Skagit River System Cooperative are conducting innovative research to identify the habitat factors limiting the survival of juvenile Chinook in the Skagit River delta and estuary in Puget Sound. The six populations of spring, summer, and fall Chinook exhibit diverse juvenile life histories in the Skagit River, rearing for variable periods in freshwater or tidal delta areas before migrating to marine waters. Many of the fish inhabit the diverse and productive habitat in the tidal delta for several months, attaining rapid growth that predisposes higher marine survival. But the Skagit delta has been radically altered in the last 100 years, and the area and quality of habitat available to juvenile salmon has been substantially reduced.

Sampling of juvenile Chinook during the estuarine/delta rearing phase has yielded valuable information about life history, diet, and habitat usage. The duration of rearing in freshwater, the tidally-influenced delta, and the nearshore marine area can be determined from detailed patterns of growth recorded on tiny otoliths (ear bones). Results indicate that survival to adulthood in the marine environment is much higher for juveniles that rear longer in the delta habitat. Survival is lower for fry that migrate directly to the marine environment. The research has immediate relevance to planning the recovery of Skagit River Chinook. First, it demonstrates the production potential for existing habitat, and identifies the habitat limiting factors that constrain increased production. Second, habitat restoration and production efforts can be focused to improve delta habitat and alleviate carrying capacity limitations. Similar research is underway in other systems in Puget Sound to demonstrate the key limiting factors and recovery pathways for other stocks.

